

Ocean Surface Current Vectors from MODIS Terra/Aqua Sea Surface Temperature Image Pairs, Phase I

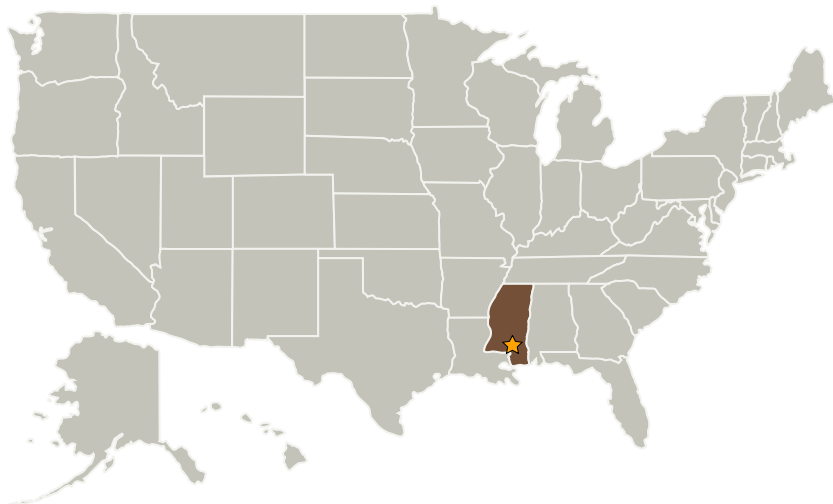
Completed Technology Project (2004 - 2004)



Project Introduction

Satellites that record imagery of the same sea surface area, at times separated by a few hours, can be used to estimate ocean surface velocity fields based on the apparent motion of patterns observed in a pair of images. Human interactive, statistical, model inversion, and feature correspondence methods have all been applied to this problem in the past. Previous methods used Advanced Very High Resolution Radiometer (AVHRR) data, which offered only long time separations, and geolocation inaccuracies that were often detrimental to the accuracy of the retrieved velocity vectors. Also, the previous methods were developed as scientific studies, and as such, require scientific sophistication or computing facilities that make them poor candidates for commercialization. This proposal addresses the development of a new method that uses genetic algorithms to minimize a cost function based on conservation laws and dynamical constraints. The method will utilize Moderate-resolution Imaging Spectroradiometer (MODIS) imagery that has important improvements over AVHRR imagery. Surface current estimates are important to forecasting drift of harmful algal blooms, oil spills, downed pilots, lost boaters, and free-floating mines. Many of these applications are crucial to decision support systems that NASA is currently supporting or investigating for future support.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
Geospatial Insights, Inc.	Supporting Organization	Industry	Stennis Space Center, Mississippi

Primary U.S. Work Locations

Mississippi

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Ronald Holyer

Technology Areas

Primary:

- TX10 Autonomous Systems
 - └ TX10.1 Situational and Self Awareness
 - └ TX10.1.3 Knowledge and Model Building